AMENDMENTS TO THE CLAIMS

For the convenience of the Examiner, all claims have been presented whether or not an amendment has been made.

1. **(Currently Amended)** A method for feature selection based on hierarchical local-region analysis of feature characteristics in a data set, comprising:

partitioning a data space associated with a data set into a hierarchy of pluralities of local regions;

evaluating a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

~~using a similarity metric to evaluate for each local region a relationship measure between input features and a selected output; and~~

identifying one or more relevant features, by using the relationship measure for each local region.

2. **(Original)** The method of claim 1 further comprising:

determining a feature relevancy of a selected feature by performing a weighted sum of the relationship measures for the selected feature over the plurality of local regions.

3. **(Original)** The method of claim 2, wherein weights for the weighted sum are based on sizes of the respective local regions.

4. **(Original)** The method of claim 1, wherein the partitioning of the data space into the hierarchy of pluralities of local regions is performed by hierarchical clustering of the data set in a plurality of levels.

5. **(Original)** The method of claim 4, wherein feature relevancies are determined for each of the input features based on the relationship measures at each level of the hierarchical clustering and the relevant features are identified based on the feature relevancies.

6. **(Original)** The method of claim 1 further comprising:

determining for each local region a corresponding subset of relevant features based on the relationship measures for the local region.

7. **(Original)** The method of claim 6, wherein the subsets of relevant features for respective local regions are non- identical.

8. **(Original)** The method of claim 1, wherein the local regions are nonoverlapping.

9. **(Currently Amended)** The method of claim 1, wherein the ~~similarity~~ metric is linear.

10. **(Currently Amended)** The method of claim 1, wherein the ~~similarity~~ metric includes a projection or distance.

11. **(Original)** The method of claim 1, wherein the relationship measure includes a correlation.

12. **(Currently Amended)** The method of claim 1, wherein the relationship measure includes [[R^2]] an R-squared value.

13. **(Currently Amended)** A computer system, comprising:

a processor; and

a program storage device readable by the computer system, tangibly embodying a program of instructions executable by the processor to: ~~perform the method claimed in claim 1.~~

partition a data space associated with a data set into a hierarchy of pluralities of local regions;

evaluate a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

identify one or more relevant features, by using the relationship measure for each local region.

14. **(Currently Amended)** A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to: ~~perform the method claimed in claim 1.~~

partition a data space associated with a data set into a hierarchy of pluralities of local regions;

evaluate a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

identify one or more relevant features, by using the relationship measure for each local region.

15. **(Currently Amended)** A computer data signal transmitted in one or more segments in a transmission medium which embodies instructions executable by a computer to: ~~perform the method claimed in claim 1.~~

partition a data space associated with a data set into a hierarchy of pluralities of local regions;

evaluate a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

identify one or more relevant features, by using the relationship measure for each local region.

16. **(Currently Amended)** A method for feature selection based on hierarchical local-region analysis of feature characteristics in a data set, comprising:

partitioning a data space corresponding to a data set into a hierarchy of pluralities of local regions;

evaluating a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

~~on each level of the hierarchy, using a similarity metric to evaluate for each local region in the level a relationship measure between input feature values on the one hand and a selected output on the other hand; and~~

determining a relevancy of a selected feature by performing a weighted sum of the relationship measures for the feature over the plurality of local regions at appropriate levels.

17. **(Original)** The method of claim 16, wherein the partitioning of the data space is performed through hierarchical clustering of the data set in a plurality of cluster levels.

18. **(Original)** The method of claim 17 further comprising:

identifying relevant features at each level of the hierarchical clustering and determining corresponding feature relevancies.

19. **(Original)** The method of claim 16, wherein weights for the weighted sum are based on sizes of the respective local regions.

20. **(Original)** The method of claim 16 further comprising:

ranking the input features according to the corresponding feature relevancies of the input features.

21. **(Original)** The method of claim 16, wherein the local regions are nonoverlapping.

22. **(Currently Amended)** The method of claim 16, wherein the ~~similarity~~ metric is linear.

23. **(Currently Amended)** The method of claim 16, wherein the ~~similarity~~ metric includes a projection or distance.

24. **(Original)** The method of claim 16, wherein the relationship measure includes a correlation.

25. **(Currently Amended)** The method of claim 16, wherein the relationship measure includes [[R^2]] an R-squared value.

26. **(Currently Amended)** A computer system, comprising:

a processor; and

a program storage device readable by the computer system, tangibly embodying a program of instructions executable by the processor to: ~~perform the method claimed in claim 16.~~

partition a data space corresponding to a data set into a hierarchy of pluralities of local regions;

evaluate a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

determine a relevancy of a selected feature by performing a weighted sum of the relationship measures for the feature over the plurality of local regions at appropriate levels.

27. **(Currently Amended)** A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to: ~~perform the method claimed in claim 16.~~

partition a data space corresponding to a data set into a hierarchy of pluralities of local regions;

evaluate a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

determine a relevancy of a selected feature by performing a weighted sum of the relationship measures for the feature over the plurality of local regions at appropriate levels.

28. **(Currently Amended)** A computer data signal transmitted in one or more segments in a transmission medium which embodies instructions executable by a computer to: ~~perform the method claimed in claim 16.~~

partition a data space corresponding to a data set into a hierarchy of pluralities of local regions;

evaluate a relationship measure for each local region using a metric based on similarity between input features and a selected output; and

determine a relevancy of a selected feature by performing a weighted sum of the relationship measures for the feature over the plurality of local regions at appropriate levels.